DRAFT FOR PUBLIC COMMENT

West Coast Governors' Global Warming Initiative

Emission Reductions at Truck Stops

Working Group 2 Report
April 13, 2004

Commitment Statement

The three states are committed to reduce emissions from diesel fuel in transportation by creating a system of for reducing emissions at truck stops along the I-5 corridor that stretches from Canada to Mexico. Reducing greenhouse gases ("GHG") can be achieved by:

- Establishing a core network of facilities along the west coast Interstate 5 (I-5) corridor that will enable truck drivers to rest or "overnight" in their sleeper cabs without idling their truck engines.
- Instituting similar and compatible programs to encourage or require truck operators to use these facilities as they are established.
- Developing additional proposals for later consideration beyond the initial September, 2004, progress date to reduce truck idling GHG emissions.
- Expanding the transportation corridors where such facilities are established and defining additional measures that reduce unnecessary truck idling.
- Developing all measures in a manner that maximizes the reductions of health threatening pollutants, such as diesel particulate matter ("diesel PM") and smog-forming oxides of nitrogen ("NOx").

Background

The transportation sector contributes roughly 30 percent of the total U.S. GHG emissions, and heavy-duty trucks account for about 15 percent of the GHG emissions from the transportation sector. Most of the emissions from truck operation occur as the truck is moving freight and commodities, but an estimated five to ten percent of total fuel is consumed when the engine is idling. To the extent that unnecessary idling can be reduced, emissions of GHGs and air pollution can be reduced without detriment to goods movement.

Long distance trucks are often equipped with sleeper cabs that enable drivers to sleep and rest in the truck itself. When the sleeper cabs are in use, heating, cooling and electricity are provided by the truck's diesel engine. Fuel consumption is estimated to be between 0.8 and 1.2 gallons per hour, or about 10 gallons per overnight use of a sleeper cab, assuming 10 hours of operation. This use of diesel fuel contributes to global warming, and produces substantial amounts of diesel PM and smog-forming NOx, but does not contribute directly to the movement of freight or commodities. In addition, large numbers of trucks often congregate at truck stops or rest areas, and their emissions can produce local areas of relatively high exposure to diesel PM.

There are more than 200 truck stops/plazas and 150 rest stops throughout California, Oregon and Washington. These facilities provide an estimated 16,000 to 20,000 truck parking spaces. According to a June 2002 report to Congress by the Federal Highway Administration, the demand for truck parking spaces in many parts of the country outstrips the supply. For instance, in California alone, with about 11,000 available spaces, the estimated demand is nearly 20,000 spaces per day during peak hours. Parking overflow usually ends up on public side streets, highway off ramps, and around distribution points.

It is estimated that 90 percent of the truck parking spaces are occupied by out-of-state trucks and 10 percent are in-state based. Based on an unpublished truck stop marketing survey by a leading manufacturer of auxiliary power units, trucks idle for about 90 percent of the time while in parking spaces. Parking spaces are occupied over the entire 24-hour day with the heaviest use during the evening hours. Parking space use averaged about 79 percent, with average ranges of 73 percent to 89 percent, but it can be as high as 100 percent in some locations.

According to a 2000 Argonne National Laboratory study, the average interstate truck equipped with a sleeper cab idles for about 1,800 hours per year. The truck industry spends roughly $1.6 billion per year on truck driver comfort during resting or sleeping. Emissions from truck idling due to sleepers in California are estimated to be about 0.65 tons per day of PM and 28 tons per day of NOx. These combined emissions represent about 5 percent of the total PM and NOx emissions from big rig trucks.

Alternatives to using the truck engine to provide utilities to sleeper cabs exist. One option is to provide the truck with heating or cooling via a flexible duct in a system that also provides electrical and electronic utilities such as cable TV and Internet hookups (for example, the IdleAire technology). The trucker will pay a fee for such service, but in most cases there are net savings due to lower fuel and maintenance costs. About 200 hookups for these systems are now deployed at a small number of truck stops along major truck routes in California, and an estimated 600 hookups are available nationwide. Other options include auxiliary power units ("APUs") on the truck that are far more fuel efficient than the main engine and sleeper cabs with heating and cooling systems that are independent from the main truck engine and can be plugged into local electrical outlets.

Relative to using the truck engine for auxiliary power, use of alternative systems such as IdleAire or APUs is expected to produce between 75 to 98 percent less GHG emissions. These alternatives result in 90 percent less NOx, and diesel PM emissions are reduced by 75 percent with APUs and virtually eliminated in systems that rely on electrical hookups. Several thousand long distance trucks travel the I-5 corridor daily. (Caltrans estimates big rig volume at the California -Oregon border to be almost 4,000 per day.) Many of these trucks must stop to allow drivers to rest or sleep during long-distance trips and drivers potentially could use alternatives for powering their sleeper cabs while resting.

The California Air Resources Board ("CARB") is considering a regulation limiting unnecessary idling from heavy-duty motor vehicles, including trucks. The regulation

would require drivers of diesel-fueled motor vehicles to shut off the engine within a 5-minute limit upon reaching a destination. Shutting off the engine will save both fuel and wear on engines.

Several options exist for trucks with sleeper cabs to comply with the regulation, including the use of truck stop electrification systems and APUs. These systems at a minimum provide heating, air conditioning, and electric power to run accessories such as computers, microwave ovens, and video equipment, or they have such accessories built into the system. Truck engine manufacturers are developing new engine systems to include integrated APUs and improved provisions for use of "shore power." These systems will provide all of the necessary heat, power, and air conditioning as integral truck units without duplicating existing truck equipment or breaking into the existing truck systems. In the future, trucks may be equipped with fuel cells that could provide all of the low-cost power needed to maintain driver comfort and entertainment.

Options Under Consideration

- Pursue a voluntary, informational effort to inform the truck stop operators, truckers and the public of the benefits of reduced-emissions truck stops that provide alternatives to engine idling for sleeper cabs. Publicize progress and promote rapid expansion of the needed facilities.
- Develop a plan to expand the availability/use of alternatives to engine idling for sleeper cabs to encompass the entire I-5 corridor.
- Provide incentives or other support to expand deployment of this technology in each state; for instance, California currently has such a program for a limited time for IdleAire systems.
- Require truck stop operators to implement this technology and require truck operators to use these alternatives where they are available.

Pros and Cons of Each Option

The primary benefit to the public from the reduction of unnecessary idling is a savings in the use of fossil fuel, with a corresponding benefit for GHG emissions, and a reduction in airborne emissions of chemicals known to increase the risk of cancer. In addition, reducing diesel PM emissions may reduce the incidents and intensity of asthma.

For the truck operator/owner, reduced idling will result in a corresponding reduction in diesel fuel consumption and maintenance costs. It has been estimated that one hour of idling equals 100 miles of highway travel in terms of maintenance. Assuming 1,800 hours per year of idling, the average truck could be driven 18,000 more miles before the next scheduled maintenance. For the driver, there will be an immediate improvement in the working environment with the reduction of noxious exhaust emissions and the reduction or elimination of engine noise and vibration during rest periods. This could result in better overall sleep conditions and could reduce the risk of driving with fatigue.

The advantage of the independent electrical air conditioning and heating systems is that drivers will be able to use factory-installed equipment to take advantage more effectively of electrical hookups. However, the cost of trucks equipped with such systems will increase. An advantage of systems such as IdleAire is that there is no up front cost other than a window template. Users are charged on an hourly basis, which is estimated to be about $1.25 per hour. However, such systems may not be available at every truck stop location and may include services not needed by the driver.

APUs can service this need, but can cost from $6,000 up to $12,000 to install. Preliminary estimates show that this cost can be recouped through fuel and maintenance savings within the first three to four years. However, APUs other than fuel cells do emit both PM and NOx. Currently these emissions are significantly lower than those emitted by the primary engine on an hourly basis, but this may not be true as the cleaner, low emissions engines are phased in beginning in 2007. Truckers may be hesitant to install additional equipment on their vehicles because of cost, space and weight considerations.

For the truck stop operator, providing on-site services for idling reduction represents a financial risk as well as physical infrastructure that require maintenance. The risk can be tolerated if the facilities are regarded as attractive and affordable by the truck drivers and if they either directly or indirectly result in additional revenue. On-site infrastructure must also be durable enough to survive occasional contact collisions with trucks maneuvering in the facility. An effective truck idling mitigation capability at a particular truck stop should generate more visits and increase income. Effective idling reduction options will reduce noise and emission impacts on adjoining neighbors as well as for those using the truck stop.

Regional Approach/Considerations

- Rapid implementation and expansion of facilities will be enhanced through a regional approach and by adopting similar efforts to encourage emission-free truck stops, to provide incentives or require this measure.
- Initiation of this effort along the entire I-5 corridor, the main interstate route used by long distance trucks, makes sense as the logical first priority. However, other high volume corridors should also be considered.

Political Considerations

This effort should have widespread support from policymakers. Environmental and public health advocacy groups and environmental justice organizations would support efforts to reduce impacts from truck idling. Support among truckers, trucking companies and trucking associations would be strongest where the net economic gains from reducing idling are clearest. However the Working Group will need to be responsive to concerns raised by user groups, for instance those outlined above, in order to generate support for the specific approach taken. If mandated participation is included in the effort, opposition is likely to increase among truck stop operators, truck owner/drivers and trucking companies. Although this effort is expected to have net economic benefits, it

may affect some parties adversely, and could require capital expenditures that are difficult for some participants.

Fiscal or Legislative Implications

- Initial assessments indicate that this measure should result in benefits for truck stop operators and result in net lifetime savings for truck owners. Therefore, this measure should have both positive economic and environmental benefits.
- Incentives in the form of government grants, tax credits or loans will likely be needed to ensure that capital needs are met for at least the initial projects. Capital costs are significant. For example:
  ---It could cost up to $1 million to install advanced electrification infrastructure at a large commercial truck stop with 100 parking spaces. Projects will need to be seen as self sustaining and profitable once built to be attractive to private sources of funding for capitalization.
  ---APU installation could cost about $7,000 per vehicle with total costs depending upon the number of vehicles fitted. Payback due to fuel savings could occur in fewer than 3 years.
  ---Providing shore power connectivity at truck stops will cost between $2,500 to $4,000 for site improvements and $2,700 for equipment installation on each truck. Payback to the vehicle owner could occur within 2 to 3 years.
- If incentives are to be provided, it will be necessary to identify funding sources, and it may be necessary to gain legislative authorization from the participating states.
- If elements are to be mandated, legislative or regulatory agency action in each of the participating states would be needed.

Possible Recommended Actions

- Establish an informational effort to inform the truck stop operators, truckers, and the public of the benefits of reduced-emission truck stops that provide alternatives to engine idling for sleeper cabs. Publicize the positive experiences at West Coast locations.
- Develop a plan and install facilities at a specified number of commercial truck stops and safety rest areas along the I-5 corridor by December 2006.
- Commit each state to review and consider adoption of an anti-idling measure that will eventually phase out most overnight idling based on the measure now being developed in California.